US 20210293768A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2021/0293768 A1**

Johnson et al. (43) **Pub. Date: Sep. 23, 2021**

(54) **GAS EXCHANGE TRANSIENT BUFFERING SYSTEMS AND METHODS**

(71) Applicant: **Li-Cor, Inc.**, Lincoln, NE (US)

(72) Inventors: **Mark A. Johnson**, Lincoln, NE (US); **Robert D. Eckles**, Lincoln, NE (US); **Douglas J. Lynch**, Lincoln, NE (US); **Johnathan I.E. McCoy**, Lincoln, NE (US); **Jason Hupp**, Lincoln, NE (US)

(21) Appl. No.: **17/198,879**

(22) Filed: **Mar. 11, 2021**

Related U.S. Application Data

(60) Provisional application No. 62/992,618, filed on Mar. 20, 2020.

Publication Classification

(51) **Int. Cl.**
G01N 33/00 (2006.01)

(52) **U.S. Cl.**
CPC ***G01N 33/0098*** (2013.01)

(57) **ABSTRACT**

Gas exchange analysis methods and systems utilize a water vapor buffering component including a material configured to buffer water vapor in a flow of a gas, whereby fluctuations in the water vapor content in the flow of the gas are slowed for components downstream from the water vapor buffering component. Components downstream of the water vapor buffering component may include: a first water vapor sensor configured to receive the flow of the gas from the water vapor buffering component and configured to measure a first concentration of water vapor in the gas; a sample chamber configured to receive the gas exiting the water vapor buffering component or the first water vapor sensor and to hold a sample capable of adding or removing water vapor from the gas; and a second water vapor sensor configured to measure a second concentration of water vapor in the gas exiting the sample chamber.